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# THE PHILIPPINE ISLANDS

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## PAPER MATERIALS

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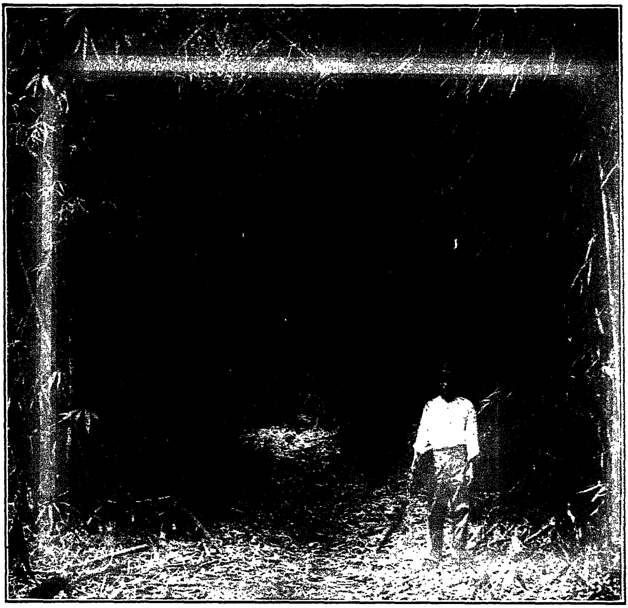
pulp can be worked the same as wood pulp, and that no alteration in the machinery is necessary. The paper takes both letter press and lithographic work admirably.

Among the fibrous products of our tropical and subtropical forests, none is more likely to take a leading place as a paper-making material than bamboo. Its accessibility, being found within easy reach of waterways; the size of the stems, giving a larger return per head per day for the cutting force than the smaller annual grasses; the ease with which it yields to the same methods of treatment as have been so successful with wood, together with its greater abundance, mark it out as the fittest and most natural successor to the position occupied by spruce and pine trees during the last thirty years Its power of self-production renders impossible an exhaustion of supply, as has occurred with spruce and pine.

Recently a survey was made of Bataan Province, Luzon. This survey shows that there are two regions, one of 1,970 acres and another of 1,600 acres, which are well covered with bamboo. Much of this area is near waterways and easily accessible. It is estimated that an area of 2,470 acres of bamboo would supply a pulp mill of 20 tons' daily capacity for three years of three hundred working days each, not taking into consideration the growth of the bamboo during this period; or, working on a three-year rotation, which is entirely feasible, such an area would supply a mill of this capacity indefinitely. There is no limit to the bamboo supply of the Philippines.

One of the chief difficulties in the manufacture of paper pulp in the Islands is the necessity of importing the chemicals used in the process either from the United States or Europe, with the consequent higher cost of production. A solution of this problem would be the electrolytic decomposition of salt, which is found in large quantities here, thus preparing both the alkali and bleach on the spot.

In spite of the necessity of importing chemicals, the maximum estimated cost per ton of unbleached paper pulp produced is only $21 (free on board) in Manila. This would insure the manufacturer a handsome profit.



Typical bamboo (*Schizostachyum*) forest, Bataan, Luzon.

Besides bamboo, there are other sources of raw material. Two grasses, cogon and talahib, grow wild in the Philippines in sufficient quantities to be of economic importance. Cogon grass is as readily worked into paper pulp as esparto grass, which is being used in Europe, and yields practically the same quality and quantity of cellulose. Talahib is generally distributed throughout the Archipelago and is frequently confounded with cogon grass.

It is very different from the latter, however, in appearance and in its habit of growth. When dry it is somewhat more difficult to convert into pulp than is cogon grass, but when the right stage of growth is chosen it yields readily to treatment, producing a good yield and a fine quality of paper pulp.

Abacá, or manila hemp as it is sometimes termed, is a species of wild banana. So-called manila paper has long been made from worn-out ropes of this fiber. Its superior quality for the manufacture of special kinds of paper where strength is the desideratum is well demonstrated. According to the Twelth Report of the United States Census, American paper manufacturers purchased approximately 100,000 tons of so-called manila stock for use in their mills; the approximate cost was $2,500,000, or $25 per ton. This stock was made up of old, worn-out rope, gunny sacks, waste thread, and binder twine; it also included jute butts and waste.

After abacá, maguey, or sisal hemp may well be ranked as the second most important fiber-producing plant of the Philippine Islands. It, like abacá, is used for cordage and likewise finds its way to the paper mills in the form of old rope, binder twine, etc.

The banana and plantain are also well worth considering as regards their availability for paper stock. The Philippines and the Malay Archipelago are the regions richest in bananas. The entire cultivated area devoted to bananas was reported as being 83,802 acres, upon which 14,078,600 bunches of the fruit were said to have been produced. This also represents the number of stalks which practically go to waste at the present time, for after the fruit is harvested they are allowed to rot on the ground. These data do not include the wild nonedible species of bananas which are so common in all parts of the Islands. These plants are easily worked into paper stock of good quality.

The palms which might be used for the preparation of paper pulp include the betel nut, nipa, buri, and coconut palms.

Several woods are available for the manufacture of paper. In Bataan Province, in one wooded section on Binouañgan River, the estimated total stand of *cupang, lauan,* and *mayapis,* is given as—

| | Cubic feet. |
|---|---|
| Cupang | 1,870,720 |
| Lauan | 1,578,960 |
| Mayapis | 1,040,400 |
| Total | 4,490,080 |

This includes only the merchantable stand in the basin, after making an average deduction of 20 per cent for unsound timber; hence, 5,000,000 cubic feet of pulp wood may be obtained from this one small area. The merchantable stand of timber on 11,339 acres of public forest on the eastern coast of Mindoro shows a yield of 14,060,800 cubic feet; of this amount, 6,453,400 cubic feet are white lauan. These trees all yield an excellent quality of paper pulp.

In the search for a supply of paper-stock material, attention is being turned to the Orient, and the Philippine Islands will soon claim their place and share in this new industry of the Tropics.

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